CLAIMS:

1. A method for measuring a plurality of different organisms in a sample comprising:

   (a) contacting said sample with an extraction reagent comprising nitrous acid, thereby forming an assay composition; and

   (b) measuring, in said assay composition, markers of said plurality of organisms so as to measure said plurality of different organisms.

2. The method of claim 1, wherein said plurality of organisms includes a first organism that is a gram positive bacterium, said extraction reagent extracts a first marker from said first organism and said measuring step comprises measuring said first marker.

3. The method of claim 2, wherein said first organism is a *Streptococci* or *Enterococci* bacterium and said first marker is a cell wall-associated antigen.

4. The method of claim 3, wherein said first organism is a Streptococci Group A, B, F or G bacterium and said first marker is a group specific antigen.

5. The method of claim 2, wherein said plurality of different organisms includes a second organism selected from the group consisting of fungi, viruses and gram negative bacteria.

6. The method of claim 2, wherein said plurality of different organism includes a second organism comprising a second marker, said measuring step comprises measuring said second marker and said second marker is a protein, nucleic acid and/or lipid marker.

7. The method of claim 1, wherein said sample comprises mucus.

8. The method of claims 1, wherein said sample is a nasal or pharyngeal sample or genital discharge sample.

9. The method of claim 1, wherein said extraction reagent further comprises a surfactant.

10. The method of claim 1, wherein said markers are measured in said assay composition using a multiplexed assay format.

11. The method of claim 10, wherein said multiplexed assay format is a multiplexed immunoassay format.

12. The method of claim 11, wherein said measuring step comprises contacting said assay composition with a patterned array of immobilized antibodies.

13. The method of claim 1, further comprising neutralizing the pH of said assay composition.

14. A method for measuring a plurality of different organisms in an upper respiratory tract sample comprising:

(a) contacting said upper respiratory tract sample with an extraction reagent comprising nitrous acid, thereby forming an assay composition;

(b) incubating said assay composition under conditions suitable to extract a cell wall-associated antigen from a streptococcus bacterium; and

(b) measuring, in said assay composition, said antigen and one or more additional markers including a marker of at least one virus.

15. The method of claim 14, wherein said streptococcus bacterium is a Streptococci Group A, B, F or G bacterium and said antigen is a group specific antigen.

16. The method of claim 15, wherein said marker of at least one virus is a protein, nucleic acid and/or lipid marker.

17. The method of claim 15, wherein said virus is selected from Rhinovirus virus, Parainfluenza virus, Influenza type A, B or C virus, Respiratory syncytial virus (RSV), Coronavirus, Adenovirus, Coxsackie A virus, Herpes simplex virus, Enterovirus, Epstein-Barr virus, Cytomegalovirus, or Papillomavirus.

18. The method of claim 15, wherein said one or more additional markers include a marker of influenza A, a marker of influenza B and a marker of respiratory syncytial virus (RSV).

19. The method of claim 14, wherein said sample is a nasal wash or a throat swab.

20. The method of claims 14, wherein said extraction reagent further comprises a surfactant.

21. The method of claim 14, wherein said antigen and said one or more additional markers are measured in said assay composition using a multiplexed assay format.

22. The method of claim 21, wherein said multiplexed assay format is a multiplexed immunoassay format.

23. The method of claim 21, wherein said measuring step comprises contacting said assay composition with a patterned array of immobilized antibodies.

24. The method of claim 14, further comprising neutralizing the pH of said assay composition.

25. A kit for measuring a plurality of different organism types in a sample comprising, in one or more containers: (a) an acid; (b) a nitrite salt; (c) a surfactant; (d) a first binding reagent that binds a first marker from a first of said plurality of different organism types and (e) a second binding reagent that binds a second marker from a second of said plurality of different organism types.

26. The kit of claim 25, wherein said first and second binding reagents are antibodies.

27. The kit of claim 25, wherein said first of said plurality of different organism types is a gram positive bacterium.

28. The kit of claim 27, wherein said gram positive bacterium is a *Streptococci* or *Enterococci* bacterium and said first marker is a cell wall-associated antigen.

29. The kit of claim 28, wherein said gram positive bacterium is a Streptococci Group A, B, F or G bacterium and said first marker is a group specific antigen.

30. The kit of claim 27, wherein said second of said plurality of different organism types is selected from the group consisting of fungi, viruses and gram negative bacteria.

31. The kit of claim 27, wherein said second marker is a protein, nucleic acid and/or lipid marker.

32. The kit of claim 25, further comprising a solid support having a patterned array of antibodies immobilized thereon, said patterned array including a first region having said first binding reagent and a second region having said second binding reagent.

33. The kit of claim 25, further comprising a base or pH buffer for neutralizing said acid.

34. The kit of claim 25, wherein said nitrite salt and/or said acid is in a dry form.

35. The kit of claim 25, wherein said nitrite salt and/or said acid is in solution.

36. The kit of claim 25, wherein said nitrite salt and said acid are present in a combined form as nitrous acid.

37. A kit for measuring a plurality of different organism types in a sample comprising, in one or more containers: (a) an acid; (b) a nitrite salt; (c) a surfactant; (d) a first antibody that binds a first marker that is a cell wall-associated antigen from a streptococcus bacterium and (e) a second antibody that binds a second marker from a virus.

38. The kit of claim 37, wherein said streptococcus bacterium is a Streptococci Group A, B, F or G bacterium and said first marker is a group specific antigen.

39. The kit of claim 38, wherein said second marker is a protein, nucleic acid and/or lipid marker.

40. The kit of claim 38, wherein said virus is selected from the said virus is selected from the group consisting of Rhinovirus, Parainfluenza virus, Influenza type A or B virus, Respiratory syncytial virus (RSV), Coronavirus, Adenovirus, Coxsackie A virus, Herpes simplex virus, Enterovirus, Epstein-Barr virus, Cytomegalovirus, and Papillomavirus.

41. The kit of claim 37, further comprising a solid support having a patterned array of antibodies immobilized thereon, said patterned array including a first region having said first antibody and a second region having said second antibody.

42. The kit of claim 37, further comprising a base or pH buffer for neutralizing said acid.

43. The kit of claim 37, wherein said nitrite salt and/or said acid is in a dry form.

44. The kit of claim 37, wherein said nitrite salt and/or said acid is in solution.

45. The kit of claim 37, wherein said nitrite salt and said acid are present in a combined form as nitrous acid.

46. The kit of claim 37, wherein said surfactant is a non-ionic surfactant.

47. A kit for measuring a plurality of different organism types in a sample comprising, in one or more containers: (a) an acid; (b) a nitrite salt; (c) a surfactant; (d) a first antibody that binds a first marker that is a group specific antigen from Streptococci Group A, B, F or G bacteria; (e) a second antibody that binds a second marker from influenza A; (f) a third antibody that binds a third marker from influenza B and (g) a fourth antibody that binds a fourth marker from respiratory syncytial virus (RSV).

48. The kit of claim 47, further comprising a solid support having a patterned array of antibodies immobilized thereon, said patterned array including a first region having said first antibody, a second region having said second antibody, a third region having said third antibody and a fourth region having said fourth antibody.

49. The kit of claim 47, further comprising a base or pH buffer for neutralizing said acid.

50. The kit of claim 47, wherein said nitrite salt and/or said acid is in a dry form.

51. The kit of claim 47, wherein said nitrite salt and/or said acid is in solution.

52. The kit of claim 47, wherein said nitrite salt and said acid are present in a combined form as nitrous acid.

53. The kit of claim 47, wherein said surfactant is a non-ionic surfactant.

54. A method for extracting two or more markers from a matrix comprising contacting a sample containing said matrix with an extraction reagent, wherein said extraction reagent comprises an oxidizing acid.

55. A method for extracting one or more markers from a matrix comprising contacting a sample containing said matrix with an extraction reagent, wherein said extraction reagent comprises an oxidizing acid and wherein said one or more markers includes a marker selected from the group consisting of protein, peptide, toxin, nucleic acid, lipid and combinations thereof.

56. A method for extracting one or more markers from a matrix comprising contacting a sample containing said matrix with an extraction reagent, wherein said extraction reagent comprises an oxidizing acid and wherein said one or more markers includes a viral marker, a fungal marker or combinations thereof.

57. A method for measuring two or more markers comprising:

(a) contacting a sample containing one or more organisms with an extraction reagent comprising an oxidizing acid, thereby preparing an assay composition; and

(b) measuring said two or more markers within said assay composition.

58. A method for measuring one or more markers comprising:

(a) contacting a sample containing one or more organisms with an extraction reagent comprising an oxidizing acid, thereby preparing an assay composition; and

(b) measuring said one or more markers in said assay composition, wherein at least one of said one or more markers includes a marker selected from the group consisting of protein, peptide, toxin, nucleic acid, and lipid.

59. A method for measuring one or more markers comprising:

(a) contacting a sample containing one or more organisms with an extraction reagent comprising an oxidizing acid, thereby preparing an assay composition; and

(b) measuring said one or more markers in said assay composition, wherein at least one of said one or more markers is a viral marker or a fungal marker.

60. The method of any one of claims 54-59, wherein said extraction reagent further comprises a surfactant.

61. The method of claim 60, wherein said surfactant is a non-ionic surfactant.

62. The method of any one of claims 54-59, further comprising separating said one or more markers from said sample.

63. The method of any one of claims 54-59, wherein said oxidizing acid comprises nitrous acid.

64. The method of claim 63, wherein said nitrous acid is prepared by mixing a nitrite salt with an acid.

65. The method of claim 64, wherein said nitrite salt and/or said acid are used in liquid form.

66. The method of claim 64, wherein said nitrite salt and/or said acid are used in dry form.

67. The method of any one of claims 54-59, wherein said oxidizing acid has a pH ranging from 2 to 5.

68. The method of any one of claims 54-59, wherein said extraction reagent is prepared by mixing: (a) a nitrite salt solution, (b) an acid solution and (c) a surfactant solution.

69. The method of any one of claims 54-59, wherein said extraction reagent is prepared by mixing: (a) a first solution comprising a nitrite salt and a surfactant and (b) a second solution comprising an acid and a surfactant.

70. The method of any one of claims 54-59, wherein said extraction reagent is prepared by mixing (a) a combination of a nitrite salt solution with a surfactant and (b) an acid in a dry form.

71. The method of any one of claims 54-59, wherein said extraction reagent is prepared by mixing (a) a combination of an acid solution with a surfactant and (b) a nitrite salt in a dry form.

72. The method of any one of claims 57-59, further comprising neutralizing the pH of said assay composition.

73. The method of any one of claims 54-56, wherein said matrix comprises a biological matrix.

74. The method of any one of claims 57-59, wherein said sample comprises a biological matrix.

75. The method of claim 73 or 74, wherein said biological matrix is a mucous excretion (exudate).

76. The method of any one of claims 54-59, wherein said sample comprises a biological sample.

77. The method of claim 76, wherein said biological sample comprises a clinical sample.

78. The method of claim 77, wherein said clinical sample is collected from a patient.

79. The method of claim 78, wherein said clinical sample is collected with a swab, suction or a wash.

80. The method of claim 77, wherein said clinical sample is a nasal or pharyngeal sample or genital discharge sample.

81. The method of claim 77, further comprising culturing said sample.

82. The method of any one of claims 54-59, wherein said one or more markers are organism markers.

83. The method of claim 82, wherein said one or more markers include at least two markers from different organisms.

84. The method of claim 82, wherein said organisms are microorganisms.

85. The method of claims 84, wherein said microorganisms comprise bacterium, virus, or fungi.

86. The method of claim 84, wherein said microorganisms are selected from bacterial strains consisting of *GABHS (Strep A), Arcanobacterium haemolyticum, Bacteroides fragilis, Enterococcus, Haemophilus influenza, Haemophilus ducreyi, Streptococcus pneumoniae, Streptococcus pyogenes, Staphylococcus aureus, Moraxella (Branhamella) catarrhalis, Parainfluenza, Treponema pallidum, Bordetella pertussis, Corynebacterium diphtheriae, Calymmatobacterium, Actinomyces, Bacteroides, Fusobacterium, Clostridium, Mobiluncus, Pseudomonas, Nocardia, Legionella pneumophila, Chlamydia trachomatis, Chlamydia pneumoniae, Chlamydia psittaci, Neisseria gonorrheae, Ureaplasma urealyticum, Gardnerella vaginalis, Mycoplasma pneumoniae, Klebsiella pneumoniae, E. coli,* and *Mycobacterium tuberculosis.*

87. The method of claim 84, wherein said microorganisms are selected from viral strains consisting of Rhinoviruses, Parainfluenza viruses, Influenza type A or B viruses, Respiratory

syncytial virus (RSV), Coronaviruses, Adenoviruses, Coxsackie A viruses, Herpes simplex viruses, Enteroviruses, Epstein-Barr viruses, Cytomegaloviruses, and Papillomaviruses.

88. The method of claim 84, wherein said microorganisms are selected from fungi consisting of *Candida spp., Candida albicans, Pneumocystis carinii, Histoplasma, Blastomyces, Coccidioides,* and *Cryptococcus.*

89. The method of claim 57, wherein said two or more markers are measured from a single detection volume.

90. The method of claim 57, wherein said two or more markers are measured from two or more detection volumes containing portions of said sample.

91. The method of claim 58 or 59, wherein said one or more markers are measured from a single detection volume.

92. The method of claim 58 or 59, wherein said one or more markers are measured from two or more detection volumes containing portions of said sample.

93. The method of any one of claims 57-59, wherein said method is a diagnostic test for patients suspected of having an infectious disease.

94. The method of claim 93, wherein said infectious disease is a respiratory disease or respiratory condition.

95. The method of claim 93, wherein said infectious disease is a venereal disease.

96. The method of any one of claims 57-59, wherein said measuring comprises an immunoassay.

97. The method of claim 57, 58 or 59, wherein said measuring comprises contacting said assay composition with one or more molecules capable of specific binding with said one or more markers.

98. The method of claim 57, wherein for each of said two or more markers, said assay composition further comprises a detection molecule capable of specifically binding with said markers.

99. The method of claim 58 or 59, wherein for each of said one or more markers, said assay composition further comprises a detection molecule capable of specifically binding with said marker.

100. A composition comprising two or more markers and an oxidizing acid.

101. A composition comprising one or more markers and an oxidizing acid, wherein at least one marker is a protein, peptide, toxin, nucleic acid, or lipid.

102. A composition comprising one or more markers and an oxidizing acid, wherein at least one marker is a viral or fungal marker.

103. The composition of any one of claims 100-102, further comprising a surfactant.

104. The composition of claim 103, wherein said surfactant is non-ionic surfactant.

105. The composition of any one of claims 100-102, further comprising a detection moiety or a capture moiety.

106. The composition of any one of claims 100-102, further comprising a detection moiety and a capture moiety.

107. The composition of any one of claims 100-102, further comprising a pH neutralizing agent.

108. The composition of any one of claims 100-102, wherein said markers are organism markers.

109. The composition of claim 100, wherein said two or more markers are organism markers from different organisms.

110. The composition of claim 108 or 109, wherein said organisms are microorganisms.

111. The composition of claim 110, wherein said microorganisms comprise bacterium, virus, and/or fungi.

112. The composition of any one of claims 100-102, wherein said markers are derived from a microorganism selected from bacterial strains consisting of *GABHS (Strep A), Arcanobacterium haemolyticum, Bacteroides fragilis, Enterococcus, Haemophilus influenza, Haemophilus ducreyi, Streptococcus pneumoniae, Streptococcus pyogenes, Staphylococcus aureus, Moraxella (Branhamella) catarrhalis, Parainfluenza, Treponema pallidum, Bordetella pertussis, Corynebacterium diphtheriae, Calymmatobacterium, Actinomyces, Bacteroides, Fusobacterium, Clostridium, Mobiluncus, Pseudomonas, Nocardia, Legionella pneumophila, Chlamydia trachomatis, Chlamydia pneumoniae, Chlamydia psittaci, Neisseria gonorrheae, Ureaplasma urealyticum, Gardnerella vaginalis, Mycoplasma pneumoniae, Klebsiella pneumoniae, E. coli,* and *Mycobacterium tuberculosis.*

113. The composition of any one of claims 100-102, wherein said one or more markers is derived from a microorganism selected from viral strains consisting of Rhinoviruses, Parainfluenza viruses, Influenza type A or B viruses, Respiratory syncytial viruses (RSV), Coronaviruses, Adenoviruses, Coxsackie A viruses, Herpes simplex viruses, Enteroviruses, Epstein-Barr viruses, Cytomegaloviruses, and Papillomaviruses.

114. The composition of any one of claims 100-102, wherein said one or more markers is derived from a microorganism selected from fungi consisting of *Candida spp., Candida albicans, Pneumocystis carinii, Histoplasma, Blastomyces, Coccidioides,* and *Cryptococcus.*

115. The composition of any one of claims 100-102, wherein said composition has a pH ranging from 2 to 5.

116. A kit for extracting two or more markers from a sample for use in one or more assays comprising, in one or more containers: (a) an acid; (b) a nitrite salt; (c) a surfactant; and (d) at least one extraction component selected from the group consisting of: (i) a pH buffer/pH neutralizer; (ii) a sampler; (iii) preservatives; (iv) stabilizing agents; (v) extraction vessel; (vi) bleach; (vii) desiccants; (viii) capture moiety; and (ix) detection moiety.

117. A kit for extracting one or more markers from a sample for use in one or more assays comprising, in one or more containers: (a) an acid; (b) a nitrite salt; (c) a surfactant; and (d) at least one extraction component selected from the group consisting of: (i) a pH buffer/pH neutralizer; (ii) a sampler; (iii) preservatives; (iv) stabilizing agents; (v) extraction vessel; (vi) bleach; (vii) desiccants; (viii) capture moiety; and (ix) detection moiety; wherein at least one of said one or more markers is a viral or fungal marker.

118. A kit for extracting one or more markers from a sample for use in one or more assays comprising, in one or more containers: (a) an acid; (b) a nitrite salt; (c) a surfactant; and (d) at least one extraction component selected from the group consisting of: (i) a pH buffer/pH neutralizer; (ii) a sampler; (iii) preservatives; (iv) stabilizing agents; (v) extraction vessel; (vi) bleach; (vii) desiccants; (viii) capture moiety; and (ix) detection moiety; wherein at least one of said one or more markers is a protein, nucleic acid or lipid marker.

119. The kit of any one of claims 116-118, wherein said one or more markers include at least one organism marker from an organism.

120. The kit of claim 119, wherein said organism is a microorganism.

121. The kit of claim 120, wherein microorganism is selected from bacterium, virus, or fungi.

122. The kit of claim 116, wherein said kit further comprises one or more binding reagents capable of binding with said two or more markers.

123. The kit of claim 117 or 118, wherein said kit further comprises one or more binding reagents capable of binding with said one or more markers.

124. The kit of any one of claims 116-118, wherein said nitrite salt and/or said acid is in a dry form.

125. The kit of any one of claims 116-118, wherein said nitrite salt and/or said acid is in a solution form.

126. The kit of any one of claims 116-118, wherein said nitrite salt and said acid are combined to form a nitrous acid.

127. The kit of any one of claims 116-118, wherein said surfactant is a non-ionic surfactant.

128. The kit of any one of claims 116-118, wherein said pH buffer/pH neutralizer is a Tris base solution.

129. A clinical method for extracting markers of pathogenic microorganisms responsible for a disease of the upper respiratory tract comprising contacting a pharyngeal and/or nasal-pharyngeal swab or a nasal wash containing mucosa with an extraction reagent comprising an oxidizing acid and a detergent thereby extracting said markers from said mucosa.

130. A clinical method for extracting markers of pathogenic microorganisms responsible for a disease of the upper respiratory tract comprising contacting a pharyngeal and/or nasal-pharyngeal swab or a nasal wash containing mucosa with an extraction reagent comprising an oxidizing acid and a detergent thereby extracting said markers from said mucosa, and wherein one or more of said pathogenic microorganisms are present and at least one of said pathogenic microorganisms is a viral particle or a fungi.

131. A clinical method for extracting markers of pathogenic microorganisms responsible for a disease of the upper respiratory tract comprising contacting a pharyngeal and/or nasal-

pharyngeal swab or a nasal wash containing mucosa with an extraction reagent comprising an oxidizing acid and a detergent thereby extracting said markers from said mucosa, and wherein two or more said pathogenic microorganisms are present and at least one of said pathogenic microorganisms is a viral particle or a fungi.